Heads IN, Hearts IN

# Marshmallow High-Rise

Instructions for Set-Up

Supplies

- ❏ "Guide for Families" handout
- ❏ Clear plastic standup display (optional)
- ❏ "Engineering Process" handout (1 per participant or family)
- ❏ Paper
- ❏ Pencils
- ❏ Jumbo marshmallows (12 per participant or family, plus some extra)
- ❏ Bowl for marshmallows (optional)
- ❏ Wooden 12-inch skewers (8–10 per participant or family)
- ❏ Ruler(s)
- ❏ Display table

Activity Preparation

▸ Purchase or locate items on supply list.

▸ Print one copy of the "Guide for Families" handout. Laminate or place in a clear plastic standup display to allow participants to see it more readily.

▸ Print one "Engineering Process" handout per participant or family. Optionally, print and laminate a few to leave on the table.

▸ Set up the display table and arrange needed supplies.

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Marshmallow High-Rise

Guide for Families
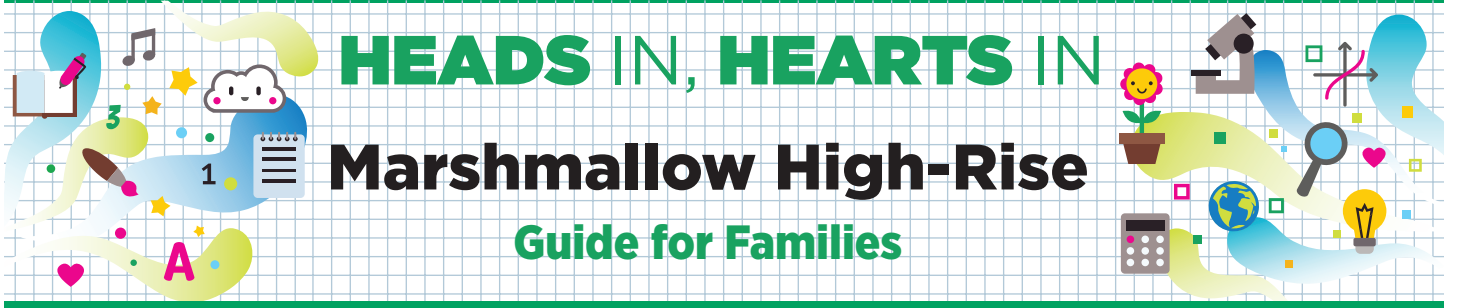
Learning Objectives

What you need to know:

Engineering is a process used to solve problems by designing, building and testing things. An engineer is a person who uses math and science to create new things, solve problems or make things better.

A **structure** is the result of building or constructing something by arranging materials or parts. In engineering, structures are specially designed to be safe and durable. How a structure or building is designed can impact how sturdy and safe it is.

What you will do and learn:

In this activity, you will practice using the engineering process to build a model of a high-rise building out of marshmallows. The goal of this activity is to build the tallest tower you can build that will stay standing on its own.

Instructions

1. Using the "Engineering Process" handout, start to work through building your high-rise.

2. Identify the problem: How can you build the tallest tower that will stay standing on its own?

3. Brainstorm: Have you seen any towers before? (Some examples might be a cellphone tower, high voltage power line tower or the Eiffel Tower.) What do they look like? What features make these towers sturdy and allow them to stand up without falling over? How can you build your tower? Think about other towers you have seen (cellphone towers, the Eiffel Tower, high voltage power lines). How can you make sure that your tower is able to stand on its own?

4. Plan: Make a drawing or sketch of your tower design. Gather your materials.

5. Build: Build your tower using the marshmallows and wooden skewers.

6. Test: Use the ruler to measure the height of your tower. How tall is it? Does it stand up on its own with the marshmallow on top?

7. Redesign: Make some changes to your design to improve your high-rise (make it taller, sturdier, shorter). Try some of the ideas you came up with during your brainstorming.

8. Repeat steps 6 and 7 as many times as needed.

9. Reflect and Discuss: What materials could you use instead of the materials provided today? How would it have been different with different materials? How is the tower you built different or similar from other towers you have seen? What about your design is similar or different from real towers? How does that affect the ability to be tall?

Engineering Process Handout

Engineering Process

1 Identify the problem

2 Brainstorm

3 Plan

4
Build → Test
Redesign

5 Reflect and discuss
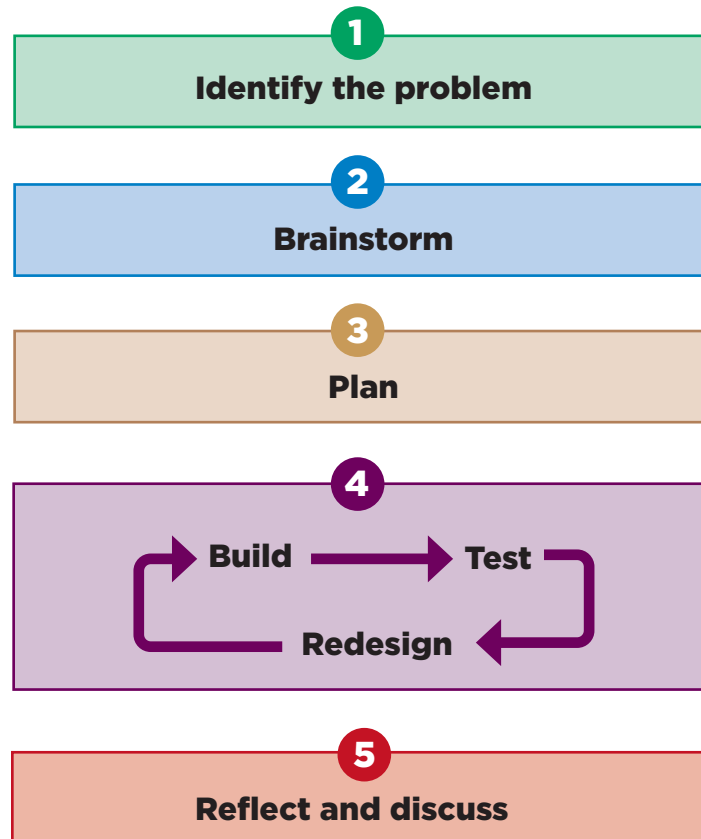
1. **Identify the problem:** Engineering is about identifying problems and designing solutions. As you go through these activities, think of the goal you are trying to achieve.

2. **Brainstorm:** What are the many different ways I could solve this problem? What are the potential advantages and disadvantages of different ideas? What things do I need to think about to make that solution successful?

3. **Plan:** What are the different ways I can solve this problem or make the build? What steps can I take to try out my solution? What do I need to do to prepare my build? What might happen if I choose that solution? During your design phase, you might discover new problems that you need to brainstorm.

4. **Build:** Construct and carry out the design. As you build your design, you might come up with more problems that you need to brainstorm and design new ideas for.

   Test: How does my solution work? Does it solve the problem? Is it effective? Are there additional problems?

   Redesign: How can I improve my design? What can I try to make my solution work better?

5. **Reflect and Discuss:** How did the solution turn out? What could I do differently next time? How would my design be different if I had different materials?